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ABSTRACT

Integrating computer-based learning tools into the curriculum has been slow, and the results of actual usage have been inconclusive; however, the potential for effective instruction should increase use by teachers and students. This ERIC Digest discusses three topics: (1) computer use in the classroom; (2) what is known about the effects of computer use on teaching and learning; and (3) trends likely to develop in the use of computers. Discussion of computer software includes drills, tutorials, simulations, and databases as the most commonly used programs in classrooms. Research results of computer use are presented in terms of the effects of drills and tutorials, simulations, and databases. Five projected trends include these beliefs: (1) computers will become standard fixtures because they have proven to be useful tools; (2) the national movement towards the development of thinking skills will be supported by the use of databases; (3) software development will increase as demands are made for curriculum integration; (4) there will be increased development of interactive videos; and (5) access to data will increase through the use of modems, CD-ROM discs, and hypermedia systems. A 14-item list of references and Educational Resources Information Center (ERIC) resources is included. (DJC))

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Computers in Social Studies Classrooms

by Charles S. White

A dozen years have passed since the entry of the microcomputer into the schools, extending to students computing power that once was available only in research laboratories. Computer applications in social studies education have lagged behind other content areas during this time. However, social studies educators have shown more and more interest in computers during the last five years. The purpose of this ERIC Digest is to present a snapshot of current computer use in social studies classrooms and to identify trends that may point to the future of computer applications in the field. This ERIC Digest addresses (1) how computers are currently being used in social studies, (2) what is known about the effects of computer use on teaching and learning in social studies, and (3) what trends are likely to develop in the use of computers in social studies education.

How Are Computers Used in the Social Studies Classroom? While computer use in schools has grown dramatically over the last few years, the level of use in social studies continues to be low compared to other subjects areas. According to Becker (1986), only 1 percent of computer use in grades K-3 was for social studies, 4 percent in grades 4-8, and 1 percent in grades 9-12.

Social studies teachers tend to use software tutorials and drills to deliver or reinforce factual knowledge. In this respect, they are not much different from teachers in other subject areas. Much of the available drill and tutorial software for social studies are "stand-alone" programs, not part of a larger curriculum package. However, publishing companies are increasingly producing software that correlate with the content of their textbook series.

Computer-based simulations may also be found in some social studies classrooms. The sophistication of social studies simulations has increased markedly since the original *Oregon Trail* (MECC), with such programs as *Where in the World is Carmen Sandiego* (Broderbund) and *The Other Side* (Tom Snyder Productions). The notion that students can step into a social system or historical setting, make decisions, and witness consequences makes the potential of simulations as learning tools very appealing to social studies teachers. Even more appealing to some educators is involvement of students in the construction of a simulation, on the assumption that one learns most about a system by having to build a model to represent it. (Roessler 1987; Roberts and Barclay 1988).

Finally, as social studies educators have become more experienced in integrating computer technology into the curriculum, they have recognized the potential of computer-based learning *tools* for students. For example, databases are powerful tools for processing information more efficiently and effectively in pursuit of problem solutions. General-purpose database tools, such as *PFS:File* and the *AppleWorks* database, allow students to build and update their own collections of data. Several software companies have produced already-built databases and curriculum materials for student exploration, such as Scholastic's *Curriculum Databases* and *Newsweek's NewsWorks*. Following the pattern established for drills and tutorials, one textbook publisher has developed databases that correlate with its elementary level social studies series.

Once students have collected or retrieved data, a data analysis tool may be helpful. For survey data, programs like *Polls and Politics* (MECC) and *Telofacts* (dilithium) help students make sense of their data, providing item analyses and displaying histograms to visually summarize results. Graphing tools also serve to summarize data and support social studies objectives relating to the interpretation of charts and graphs (*Data Plot* from Muse and *DemoGraphics* from CONDUIT are two examples). These kinds of data analysis tools reflect what Budin, Taylor, and Kendall (1987) view as a trend toward more graphics and more data manipulation in social studies computer applications.

What is Known about the Effects of Computer Use on Teaching and Learning in Social Studies? Ehman and Glenn (1987) provide a most useful and timely review of the research literature concerning the effects of computer use in K-12 social studies. In general, research that focuses explicitly on computers in social studies has proceeded very slowly. In fact, Ehman and Glenn note that much of what they report is highly impressionistic, based on limited or non-existent empirical evidence.

Effects of Drills and Tutorials. Across curriculum areas, researchers have found drill and tutorial programs to be moderately effective in producing cognitive gains at all grade levels, but especially at the elementary level of schooling. (Niemiec and Walberg 1987; Bangert-Drowns, Kulik, and Kulik 1985).

With respect to drills and tutorials in social studies, the picture is sketchy at best. Ehman and Glenn (1987) characterized the available research findings as "scattered and mixed" with respect to drill programs, tending somewhat to show a small impact on affective and lower-level cognitive outcomes. Studies involving tutorial programs linked to videodisc (Glenn, Kozen, and Pollak 1984) revealed positive effects on knowledge acquisition and application. Overall, much more research is needed to obtain a clearer picture of drill and tutorial effects in social studies.

Effects of Simulations. Early research appeared to confirm the instructional effectiveness of computer-based simulations across all subject areas. Later meta-analyses of simulation research contradicted this view (Bangert-Drowns et al. 1985), finding little support for cognitive gains attributable to simulation use.

For social studies simulations, the Ehman and Glenn (1987) review of the literature pointed to positive affective outcomes and gains in cooperative learning capabilities of students. Little evidence derived from rigorous studies supports the kinds of intellectual outcomes often associated with simulation use, but anecdotal reports of such outcomes (Roessler 1987) suggest that further research is warranted.

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Effects of Databases. As a tool to pursue inquiry, social studies educators claim great potential for database use in the classroom. The research to date lends support to these claims, showing positive effects of database use on skills relating to information processing (White 1987), data classification (Underwood 1985), and question asking (Ennals 1985). Ehman and Glenn (1987) note that databases do not in themselves teach inquiry. Indeed, the studies thus far underscore the centrality of teachers trained in inquiry and of structure in instructional materials (White 1987).

Clearly, much research remains to be done to assess the instructional effectiveness and cost effectiveness (Ehman and Glenn 1987) of computer use in social studies. The terrain is still largely unmapped, so more exploration is needed.

What Trends Are Likely to Develop in the Use of Computers in Social Studies Education? Predictions are always perilous, especially in connection with technology in schools. New, more powerful computer tools are constantly emerging, a fact that has undone more than one prognosticator. Nonetheless, five trends seem likely to develop.

If computers become standard fixtures in schools, it will be because they have proven to be useful tools for teachers. Few studies have examined how social studies teachers use computers to carry out their own work (Ehman and Glenn 1987). Assuming computer use in social studies will grow, it is likely that teachers in the field will make increasing use of general tool software, including word processors, databases, and spreadsheets. Moreover, new tools with special relevance to social studies are being developed, such as *TimeLiner* (Tom Snyder Productions), which allows teachers and students to generate historical timelines. Software companies will continue to develop a wide range of new data analysis and data representation tools that fit the content of social studies education.

There will be more focus on development of thinking skills. The national movement toward the teaching of thinking is coincident with the emergence of computer tools, such as databases that support development of thinking skills. Dede (1987) expects that more powerful "cognition enhancers" will be developed, which will increasingly shift students' foci toward the higher-level thinking tasks required for solving ill-structured problems. Use of these computer tools will require a substantial shift in the instructional process, a shift not yet evidenced in social studies classrooms generally (Ehman and Glenn 1987).

The already-apparent trend toward greater integration of computer software into the social studies curriculum will likely continue and deepen. That deepening will take software developers beyond simply targeting discrete social studies topics and facts and will result in more sophisticated computer environments in which students can learn and apply concepts and skills. This may include intelligent coaching systems, which monitor and advise students as they move through simulated social "microworlds" (Dede 1987).

Gradual expansion of interactive video will develop. Some of Dede's "microworlds" will likely be provided via interactive video, a technology that has been too expensive to be widely used in schools. The cost of interactive video has been declining, however, and social studies teachers may eventually take their students on "surrogate field trips" supported by interactive video.

Access to data will expand dramatically. Students will use telephones and modems to dial up information services like NEXIS (for indexed newspaper stories), Global Perspectives in Education's SCAN (global and international education materials), and ABC-CLIO's *Kaleidoscope* (statistics, news, and historical background on countries in the world), to name three examples (Cohen 1987; Davidson 1987; Ehman and Glenn 1987).

A considerable amount of data will also be electronically placed on CD-ROM discs and made available in the school library. For example, a single 4.72 inch CD-ROM disc holds Grolier's 20-volume *Academic American Encyclopedia* with room to spare. We can expect more of these products in the future.

Finally, hypermedia systems (Dede 1987) are emerging that provide a framework for storing, linking, cross-referencing, and annotating data spanning diverse information media (text, graphics, audio, still and full-motion video, and computer software). Such systems allow educators to represent complex networks of data, and allow students to explore those networks.

References and ERIC Resources

Following is a list of resources, including references used to prepare this Digest. Those items followed by an ED number are in the ERIC system and are available in microfiche and/or paper copies from the ERIC Document Reproduction Service (EDRS). For information about prices, write EDRS, 3900 Wheeler Avenue, Alexandria, Virginia 22304 or call 1-800-227-3742. Entries followed by an EJ number are annotated monthly in CIJE (*Current Index to Journals in Education*) which is available in libraries containing ERIC collections. EJ documents are not available through EDRS; however, they can be located in the journal section of most libraries using the bibliographic information provided below.

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